THREE

ORGANIZATION AND PLANNING

3.1 BACKGROUND

Effective organizational structures and comprehensive work planning are vital for conducting project activities safely and efficiently at hazardous waste sites. A multidisciplinary project team of line managers, supervisors, health and safety professionals, engineers, and worker representatives allows these structures and work plans to be defined and implemented for hazardous waste activities. Organization and planning requirements are established in paragraph (b) of 29 CFR 1910.120, "Hazardous Waste Operations and Emergency Response" (HAZWOPER).

At a minimum, an effective and well-organized structure for hazardous waste activities accomplishes the following:

- Establishes overall and specific organizational roles and responsibilities of different functions and disciplines;
- Provides health and safety planning at the worksite, project, and job and task levels;
- Integrates workers from different technical disciplines into project teams;
- Fosters worker participation in multidisciplinary teams involved in planning and project design, development of work control processes, and project implementation;
- Verifies that each project team has sufficient technical resources and depth to complete the project or task in a safe manner;
- Defines individual roles, responsibilities, accountabilities, and interfaces within the project team with matrixed personnel and organizations, and between contractors and subcontractors;
- Demonstrates management's commitment to a safe work environment;
- Facilitates the incorporation of lessons learned into work control processes;
- Allows completion of work in a safe and cost-effective manner within budget and schedule; and
- Recognizes and coordinates with the existing emergency response community.

Good Planning Is Good Business

There are legal, moral, and financial responsibilities associated with conducting hazardous waste activities. The magnitude and importance of these obligations demand a proactive, deliberate, and comprehensive approach to planning. Successful conduct of hazardous waste activities requires the integrated application of knowledge and experience by line managers, supervisors, health and safety professionals, engineers, and site workers. An effective management system uses multidisciplinary teams to coordinate and implement work controls.

3.2 COMMITMENT TO A SAFE WORK ENVIRONMENT

An effective health and safety program begins with a management commitment to achieve excellence in worker protection consistent with successful completion of work without work stoppage due to safety concerns. Senior management is responsible for instilling this commitment at all levels and encouraging workers to accept safety as an integral part of the work. Enhanced worker protection is a natural result of this type of commitment.

Such goals cannot be realized without (1) establishing accountability for health and safety within the project team, (2) orienting the health and safety organization toward collaboration and finding solutions while avoiding confrontation, and (3) relying on teamwork to integrate health and safety and line functions for the planning and conduct of work. To be effective, health and safety planning must be intrinsic to mission, and health and safety excellence must be a primary mission objective.

3.3 GENERAL PROJECT MANAGEMENT

OVERALL ROLES AND RESPONSIBILITIES

The Department of Energy (DOE) has ultimate responsibility for the establishment and verification of programs involving hazardous waste and related activities are carried out in a manner that protects the health and safety of its workers and the public. However, every worker is responsible for sharing in the commitment to a safe workplace. Specific health and safety responsibilities assigned to Environmental Management (EM) Headquarters and field organizations are discussed in DOE/EM-0182, *Handbook on Roles and Responsibilities for Environmental Management* (July 1994).

Contractor organizations are responsible for managing and conducting hazardous waste activities and for performing their work in accordance with applicable laws, regulations, contract provisions, and DOE rules and requirements. These are typically compiled and presented in the standards/requirements identification document (S/RID) or utilized in the necessary and sufficient process. Given that multiple contractor and subcontractor organizations are involved in each hazardous waste activity, senior management must address any misunderstandings concerning specific operational or health- and safety-related responsibilities and accountabilities that may cause problems in the daily administration of health and safety programs.

DOE's Responsibilities and Authorities

DOE's responsibilities and authorities include establishing a Departmental policy for health and safety; setting standards and requirements; requiring employees and contractors to comply with existing laws, regulations, and standards; reviewing contractor operations and programs to determine compliance status; and requiring corrective actions to remedy identified deficiencies.

Responsibilities and authorities for conducting work need to be stipulated in the contractual arrangements between the various parties involved. To provide DOE and contractor procurement and contracting organizations with a clear understanding of the multifaceted nature of EM programs, each request for proposal should include a scope of work that contains specific information about (1) overall project management responsibilities and authorities, (2) how subcontractors will be managed, and (3) the hierarchy of health and safety plans and programs.

Health and safety issues and worker protection requirements are integrated into project specifications, bid packages, contracts, and other appropriate project documentation and submittals. Health and safety representatives should be included during planning discussions and meetings. Workplace health and safety reviews should be periodically performed by health and safety professionals to verify the adequacy of hazard controls, and conducted with first-line supervisors and workers, focusing on reinforcing management controls to achieve safe work activities.

CONTRACTOR INTERACTION

Successful management of a project includes anticipating organizational issues between contractors and subcontractors and resolving those issues before work begins. Coordination and interaction between contractor organizations with responsibilities at the same worksite are best stipulated in contracts, memorandums of understanding, and contractor interface agreements. Once this relationship has been formalized, it is communicated to all affected contractors and subcontractors. DOE workers and visitors to the site also abide by established requirements.

Development of effective interorganizational strategies for health and safety plans (HASPs) is particularly crucial (see Chapter 6). Each contractor and subcontractor is responsible for its own workers, and provides a level of oversight to meet health and safety requirements. Consistent with DOE O 440.1, "Worker Protection Management for DOE Federal and Contractor Employees," however, the contractor with primary responsibility for the worksite establishes the minimum requirements. Other contractors and subcontractors should meet or exceed these requirements, as appropriate, based on the nature of their tasks and associated hazards. The contractor with primary responsibility controls access to the worksite and verifies that subcontractors fulfill their health and safety duties and responsibilities.

CONTRACTOR OVERSIGHT AND WORK CONTROL

In many cases, several prime contractors have responsibility for various hazardous waste activities and worksites at a DOE site. Prime contractors include the management and operating (M&O) contractor, the construction contractor, the environmental remediation management contractor (ERMC), and site characterization and remedial design contractors. DOE has oversight responsibility for all prime contractors. In some cases, the M&O contractor also has oversight responsibility; in others, the M&O contractor is contractually excluded from an oversight role. It is prudent to state these relationships in contractual agreements and communicate them to all affected parties.

When one contractor performs an intrusive activity that increases the hazard level for all workers at a worksite, that information should be communicated to other contractors to permit them to plan and control their activities accordingly. When the M&O contractor has oversight responsibility for other prime contractors, the M&O contractor is to make certain that other contractors observe the performance standard established for the worksite and that activities are appropriately coordinated among various contractors and subcontractors. If the M&O contractor does not have oversight authority, the DOE field office assumes that function.

When two or more prime contractors conduct activities at the same worksite, it is prudent that a common basis for health and safety rules and controls be established.

The contractor responsible for controlling access to a worksite should not allow access to persons who do not meet established site requirements.

Within the DOE field office, multiple oversight organizations may be assigned to manage contractor activities—for instance, the M&O contractor and the ERMC at a site may report to a different group. Accordingly, it is possible for a hazardous waste worksite to have more than one "owner" within the DOE field office. Whatever the arrangement, oversight authority needs to be clearly designated and well communicated.

The following actions encourage coordination and consistency among contractors:

- Prime contractors should develop interface agreements to provide a basis for understanding and coordinating their respective activities, as well as for reviewing and commenting on documents such as work plans or HASPs (see Table 3-1).
- During the project planning, affected prime contractors should have an opportunity to provide input and resolve differences. For instance, if an ERMC is planning a project at a worksite where the M&O contractor is working, the M&O contractor should participate in the planning.
- "Cross-cut" committees are encouraged to allow prime contractors to standardize or normalize such essential elements as procedures, permit systems, and training (see Table 3-1).

To ensure that all contractors and subcontractors maintain a minimum level of safety performance, DOE field office organizations need to establish a uniform "floor" of criteria.

Table 3-1. Useful Organizational Concepts for Hazardous Waste Operations

	HAZWOPER COORDINATOR	HAZWOPER COMMITTEES	HAZWOPER PLANNING AND REVIEW TEAMS	"CROSS-CUT" COMMITTEES	CONTRACTOR INTERFACE AGREEMENTS
DESCRIPTION	At large DOE sites where significant hazardous waste activities are conducted, establishing the position of HAZWOPER coordinator has proven effective in facilitating the development and implementation of health and safety initiatives. The HAZWOPER coordinator could be part of the site's overall ES&H organization and should report to a senior manager.	DOE sites with significant hazardous waste activities are encouraged to establish HAZWOPER committees. The existence of these committees can benefit both contractor and DOE field office organizations.	A number of DOE sites have formulated special multidisciplinary teams or committees to provide health and safety evaluation and to support project teams from initial design through completion of operations.	"Cross-cut" committees are generally found at large, complex sites or at sites where the activities of multiple independent contractors may require coordination and integration.	At DOE sites with more than one prime contractor, clear lines of authority should be formally established and specific responsibilities disseminated. Health and safety-related contractor interface agreements have been successfully used at DOE HAZWOPER sites to define and document organizational relationships and responsibilities.
ROLES AND RESPONSIBILITIES	Develops and implements sitewide programs, procedures, criteria, and performance standards for hazardous waste activities Participates in work planning, establishes health and safety rules and requirements, and develops the HASP Determines the applicability of the OSHA HAZWOPER Standard (i.e., whether HAZWOPER principles should be strictly applied; see Chapter 2) Establishes a hazard-based approach for various projects and worksites Assigns qualified SSHOs to various projects and worksites Provides oversight for hazardous waste activities Coordinates the activities and approaches of various contractors and subcontractors Chairs or participates in various HAZWOPER committees At Oak Ridge Reservation, the HAZWOPER coordinator position was used to establish and implement a HAZWOPER health and safety program. The coordinators for the three Oak Ridge sites (Oak Ridge National Laboratory, Y-12 Plant, and K-25 Site) interact through an overall HAZWOPER committee.	HAZWOPER committees at DOE field offices facilitate the following functions: • Promote consistency between the various DOE management and oversight organizations in interpreting and implementing the HAZWOPER Standard • Establish expectations and criteria for contractors, projects, and activities • Verify that DOE organizations responsible for worksites with multiple contractors establish consistent performance standards • Coordinate approaches to various projects and worksites • Coordinate oversight of various DOE organizations to reduce redundancy and contradictions • Facilitate contractor interface agreements • Provide timely review and approval of work plans and HASPs • Resolve contractor or project concerns and conflicts between DOE field office organizations • Coordinate and facilitate outside oversight for hazardous waste activities HAZWOPER committees established by contractor organizations facilitate the following functions: • Provide development, review, and approval of HAZWOPER health and safety programs, procedures, permits, and other criteria • Establish performance standards, criteria, and consistency within the contractor organization • Support or advise the HAZWOPER coordinator and senior management • Resolve issues with sitewide implications • Facilitate contractor interface agreements • Provide a forum to discuss current issues, new projects, and new Orders or standards and to develop recommended approaches • Interface with DOE HAZWOPER committee • Coordinate and facilitate outside oversight for hazardous waste activities HAZWOPER committees should include representatives from line management (e.g., emergency response, waste management, construction, maintenance), project design and engineering, health and safety, environmental compliance, industrial hygiene, health physics, labor, and others as warranted.	Provide oversight throughout the life of a project Promote membership of individuals who are cross-trained in multiple technical disciplines; provide increased benefit/cost Encourage members to seek each other's help when providing health and safety reviews and carrying out their support functions At Oak Ridge National Laboratory, the Safety and Health Evaluation Support Team consists of representatives from the site's engineering and design group, plus health and safety professionals, environmental specialists, construction personnel, waste management specialists, representatives from unions, and technical specialists. Aside from participating in the selection of health and safety requirements to be included in contracts, the committee reviews contracts, design packages, work packages, and other documents for issues related to health and safety.	Standardize safe work permits, site-specific exposure controls (e.g., work-rest regimens for heat stress), and definitions and interpretations (e.g., what constitutes a permit-required confined space) Promote consistency of training requirements and course approvals, radiation work permits, lockout/tagout mechanisms, and equipment (e.g., emergency escape respirators) At the Idaho National Engineering Laboratory, these committees have been used to "cut" across organizational lines to integrate elements of multiple health and safety programs. These cross-cut committees consist of health and safety representatives from several prime contractors at the INEL site. At DOE sites with more than one prime contractor, clear lines of authority should be formally established and specific responsibilities disseminated. Health and safety-related contractor interface agreements have been successfully used at DOE HAZWOPER sites to define and document organization relationships and responsibilities.	Coordinate worksite activities for multiple independent contractors Establish responsibilities for fire safety and emergency preparedness, area security, and site access Report occurrences involving employees, facilities, or equipment from more than one company Facilitate the implementation and oversight of ES&H program issues Provide operational support (e.g., regarding utilities, excavations, lockout/tagout requirements) Identify mechanisms for ongoing intercontractor communication and problem-solving

- Project management and oversight organizations at each DOE field office should establish a structure to coordinate and integrate their HAZWOPER activities. Establishing a HAZWOPER committee at the DOE field office to participate in planning and overseeing such projects serves this purpose. Whatever the method selected, activities at a given worksite should be controlled consistently, regardless of the number and types of contractors involved.

3.4 PROJECT TEAM ORGANIZATION

The size of the multidisciplinary team is dependent on the particular task to be performed and the hazards to be encountered; a full complement of disciplines is not required for every project or task. During the early stages of planning, an organization chart is developed to define the project's structure; to identify key individuals and their alternates, roles and responsibilities, and other onsite and offsite resources; to show lines of authority, responsibility, and communication; and to identify interfaces with the emergency response community. For projects of longer duration, the chart is placed in a central location, included in the HASP, and updated as necessary.

The organization chart identifies key positions within the project team including the project manager, site safety and health officer (SSHO), field team leader, and worker representatives. In addition, the command post supervisor, emergency response coordinator, decontamination station officer, and workers responsible for site security, radiological control, and other specialized positions are identified. A list of DOE and contractor workers and a list of offsite organizations to be contacted in the event of an emergency are also included. A clear work control process is also established to integrate the efforts of health and safety, health physics, and line management in evaluating planned activities, identifying hazards, and determining appropriate controls.

Selecting the SSHO

Oak Ridge employs three levels of SSHO qualifications. A "Level 1" SSHO is used at a site where Level D personal protective equipment (PPE) is necessary; a "Level 2" SSHO is assigned when Level C PPE is required; and a "Level 3" SSHO is used at Levels A and B PPE worksites. Descriptions of the qualifications for the three SSHO levels are provided in Figure 3-1.

It is customary, but not required, for the SSHO to be a health and safety professional. Depending on the nature of the hazards and activities, the SSHO may be an industrial hygienist, safety specialist, health physicist, engineer, health and safety technician, or even a worker with sufficient and appropriate experience and training to fulfill the established responsibilities of the SSHO (e.g., to recognize and control hazards). Selection of the SSHO is based on skills and experience proportionate to the hazards and difficulties of the job. Additional support staff can be matrixed to support the SSHO in the technical safety disciplines in accordance with project size and the nature of hazards encountered.

Table 3-2 provides an example of the functions and responsibilities of the project manager, field team leader, SSHO, and radiological control manager (RCM).

OTHER ONSITE ROLES AND RESPONSIBILITIES

Other key onsite roles and responsibilities assigned to members of the project team include the following:

Specialty duties are assigned to teams formed for specific tasks or responding to unusual circumstances (e.g., waste characterization, confined-space rescue, and asbestos and lead abatement). These teams are formed, as necessary, on a permanent or temporary basis. In many cases, special training, drills and exercises, and development of safe work plans are needed to prepare team members to conduct work safely and effectively.

HAZWOPER LEVEL 1 SSHO. Indicated at sites with minimal hazards where Level D personal protective equipment (PPE) is required. Minimum qualifications include the following:

- High school education;
- Work experience on projects of similar size and stature or HAZWOPER SSHO training;
- Ability to implement and verify that project activities comply with the HASP; and
- Current 40-hour, 8-hour refresher (if 40-hour training has expired), and 8-hour HAZWOPER training for supervisors.

HAZWOPER LEVEL 2 SSHO. Indicated at sites requiring the use of Level C PPE. Minimum qualifications include the following:

- Associate's degree or the equivalent in industrial hygiene, health physics, industrial safety, or other related field (work experience can be substituted if the amount and type correspond appropriately to project needs and are approved by the health physics coordinator as appropriate);
- One year of health and safety work experience in hazardous waste activities, including HASP implementation;
- Proficient in use of monitoring instruments, as warranted; and
- Current 40-hour, 8-hour refresher (if 40-hour training has expired), and 8-hour HAZWOPER training for supervisors.

HAZWOPER LEVEL 3 SSHO. Indicated at sites requiring the use of Level B PPE or higher. Minimum qualifications include the following:

- Certification or eligibility for certification in industrial hygiene, safety, health physics, or related field (can substitute work experience if amount and type correspond appropriately to project requirements and are approved by the health physics coordinator as appropriate);
- Two years of health and safety field experience, including hazardous waste operations, or equivalent, and demonstrated ability to implement HASP;
- Proficient in use of monitoring instruments, as warranted; and
- Current 40-hour, 8-hour refresher (if 40-hour training has expired), and 8-hour HAZWOPER training for supervisors.

In addition, any SSHO designated to provide first aid or cardiopulmonary resuscitation must meet the collateral-duty provision of 29 CFR 1910.1030, "Bloodborne Pathogens."

NOTE: Prerequisites that fall outside the hazardous and radiological area need to be integrated into the qualifications listed above (e.g., worker safety hazards involved in trenching or use of cranes).

Figure 3-1. Example Qualifications for Site Safety and Health Officers at Oak Ridge

Table 3-2. Example - Some Functions and Responsibilities for Key Project Personnel at Oak Ridge

Project Manager	Field Team Leader	Site Safety and Health Officer (SSHO)	Radiological Control Manager (RCM)
Has overall responsibility for directing hazardous waste activity Plans and manages the conduct of the project Designates and leads project team Directs HASP development and technical review and oversees implementation Prepares and implements work plan Implements access and hazard controls Prepares reports and maintains project records Coordinates with DOE and public officials; establishes and maintains liaison with community leaders	Has responsibility for leading and conducting activities at worksite and is stationed onsite Implements work plan and maintains schedules Coordinates with SSHO and RCM on matters related to work control, hazard analysis, and hazard control implementation Oversees implementation of HASP requirements Controls access to the worksite Provides worksite hazard communication, site-specific briefings, and field training to personnel at the worksite Works closely with the SSHO and RCM to verify that project planning has been adequate and that work is conducted safely Jointly, with SSHO, verifies team member readiness for work such as training and medical surveillance. [NOTE: For smaller projects, field team leader and project manager may be the same person.]	As team leader, has responsibility for implementation of HASP and is stationed onsite and in immediate area of hazardous waste activities Verifies effectiveness and compliance with HASP requirements Verifies that project planning focuses on health and safety Participates in work control process and conducts hazard analyses Specifies and supports implementation of hazard controls Selects and verifies effectiveness of PPE and verifies that PPE is properly stored and maintained Ensures monitoring of entry and exit of worksite; participates in access control Jointly, with field team leader, verifies team member readiness for work such as training and medical surveillance Advises medical staff of hazards and exposures Arranges monitoring of exposures and stressors Conducts field training at worksite Supports emergency action and response Verifies that the "buddy system" is properly implemented and used	As team leader, has responsibility for developing and implementing radiological control measures; verifies effectiveness and compliance with requirements May serve onsite or offsite, depending on need Serves as part of the SSHO support team Has overall responsibilities (similar to those of the SSHO) for radiological protection issues [NOTE: For smaller, predominantly radiological projects, may serve as the SSHO with support from other health and safety professionals.]

Decontamination of workers and equipment is conducted to remove and deactivate hazardous contaminants. Responsibility for this task is assigned to the project team's decontamination officer or to the shift supervisor, RCM, SSHO, or designated staff member.

Communications and emergency assistance functions include maintaining communication with work parties, assisting support zone activities, notifying emergency responders, and assisting with emergencies. A separate position (e.g., command post supervisor) is established, or these functions are assigned to a supervisor, the field team leader, or another project team member with appropriate knowledge and experience.

Emergency response planning and coordination are necessary to evaluate, direct, and control emergency response and other emergency activities. The decision to include an emergency response coordinator on the project team or to rely on the DOE site's emergency response team depends on (1) whether hazardous waste workers respond to an emergency; or (2) whether they evacuate the worksite during an emergency and contact the emergency response center. Whichever approach is used, emergency response coordination includes developing the emergency response portion of the HASP; conducting rehearsals, worker training, and drills; evaluating response actions; and providing for worksite evacuation, emergency treatment and transport of site workers, and notification of emergency units and appropriate management staff. If an emergency response coordinator is not a separate position on the project team, these responsibilities are divided among the SSHO, the field team leader, and DOE's overall emergency response coordinator.

Security issues involving access controls are line management responsibilities (e.g., field team leader and supervisors), with SSHO participation. The nature of a project may warrant assigning a member of the site security staff to the project team. Key duties of the security officer include conducting routine area patrols, controlling facility access and egress, assisting with communication during an emergency, securing accident/incident scenes, and maintaining a log of access and egress to the worksite.

TEAM INTEGRATION

Successful project teams are those in which line managers, health and safety personnel, and workers collaborate to plan and conduct work, and are organized along the following guidelines:

- The broader environment, safety, and health (ES&H) organization provides specialty support as needed (e.g., industrial hygiene, health physics, toxicology, training, fire protection, and emergency response).

- When radiological hazards are present, occupational safety and health (OSH) and radiological protection should work together to integrate hazard evaluation and the specification of controls. This goal can be achieved within the project team through close interaction between OSH and radiological protection subteams or by placing both subteams under SSHO leadership.

- For some DOE projects or worksites, depending on the nature of the hazards present, a health physicist or other health and safety professional is responsible for integrating approaches and resolving issues related to radiological protection, industrial hygiene, and occupational safety (e.g., specification and inspection of protective clothing and respiratory protection, establishment of work zones). This individual facilitates multidisciplinary discussions on issues of mutual concern and determines which suggested approach is most likely to be acceptable for controlling all hazards.

In the past, various organizational concepts or approaches have been successfully used at DOE hazardous waste sites. The examples provided in Table 3-1 illustrate several proven approaches for meeting the special needs of specific sites.

3.5 CONSIDERING WORKER PROTECTION DURING DESIGN AND PLANNING

Integrating health and safety planning with project design fosters teamwork between project, line, and health and safety management and encourages ownership by all parties. This type of interaction allows health and safety issues to surface and be addressed before the project is bid or the contract awarded. This process minimizes the effect of unanticipated issues during the project's mobilization phase, thereby preventing

extensive delays, costly change orders, and ineffective and inefficient retrofitting of health and safety approaches. The planning and design process produces distinct criteria for establishing the performance standard for plans and programs such as those specified by the HAZWOPER Standard and DOE rules and requirements. An understanding of these considerations by the multidisciplinary design and planning team aids in the subsequent preparation of required plans (see Figure 3-2). Examples of multidisciplinary planning teams include the Safety and Health Evaluation Support Team (SHEST) at Oak Ridge National Laboratory and the Cross-Cut Committee at Idaho National Engineering Laboratory (see Table 3-1).

The approach used to plan a project varies. However, establishing a multidisciplinary team to conduct the following planning principles related to health and safety program development is recommended:

- Stage a project, including transitioning the worksite to cleanup activities and phasing cleanup activities;
- Evaluate hazard characterization and exposure assessment information and gather additional information, as required;
- Determine applicability of HAZWOPER or other health and safety performance standards, or both, as well as content requirements and criteria for the health and safety program and the HASP;
- Determine the scope of hazardous waste activities and select remedial action technologies, techniques, and processes, using worker safety as a primary consideration during the selection and design process;
- Establish criteria for health and safety and worker protection and requirements for bid packages, contracts, specifications, work plans, and the health and safety program or HASP;
- Prepare a HASP and safety analysis report (SAR), if required, indicating engineering controls, administrative controls, and use of PPE; obtain DOE approval for Category 1, 2, and 3 SARs or SAR revisions; and develop or modify technical safety requirements (TSRs);
- Determine contractor submittals required to address health and safety and worker protection criteria and requirements;
- Define organizational structure and responsibilities;
- Set procedures for communications between contractors, site representatives, regulatory agencies, DOE, and others;
- Identify cleanup criteria and establish permissible exposure and action limits;
- Identify approval, monitoring, oversight, and worksite release procedures;
- Outline the schedule, phasing requirements, and project milestones, with protection for workers and co-located populations as a key consideration; and
- Dedicate resources and identify procurement mechanisms.

Figure 3-2. Planning Principles

3.6 HAZARD-BASED PLANNING

Hazard characterization and exposure assessment (Chapter 5) and access and hazard controls (Chapter 7) are the most important aspects of a hazard-based health and safety planning process.

Hazard-Based Planning Approach

The degree of hazard dictates the performance standard specified in various control plans; the content, detail, and formality of review and approval of these plans are based on risk and hazard potential. Using this approach, levels of risk or methods to rank risk (degree) are standardized. In general, a "hazard-based" approach refers to a process in which the level of planning and analysis, the documentation, and the actions necessary to comply with identified requirements and needs are commensurate with hazards relative to worker protection, health and safety, and safeguards and security.

Consequently, it is imperative to exercise professional judgment when planning hazardous waste activities and to document hazard-based decisions. 29 CFR 1910.120 is a hazard-based performance standard that emphasizes hazard analyses at all stages and encourages the development of programs commensurate with risk for each worksite. For example, for a given activity, professional judgment is used to decide whether a comprehensive HASP or a scaled-down 2- or 3-page version is required for activities with little possibility to cause significant exposure.

3.7 DEVELOPMENT OF PROGRAMS AND PLANS

Once the project design and hazard identification and controls have been established, project planning focuses on developing work plans and worker protection programs and plans. Several key documents that are developed during the planning phase of the project can be used to focus and direct the compliance strategy, to form the health and safety program/plan, and to establish work controls. These documents are usually developed after contract award and before mobilization. During project design, the basis and criteria for documents to be included in the design package are established.

Key Planning Documents

Key planning documents are considered prestart submittals and include the comprehensive work plan, decommissioning plan, health and safety program and/or HASP, radiological control program (if applicable and not already built into the health and safety program and HASP), emergency plan, and work control system (including the access and hazard controls that are identified in the HASP).

To be successful, all members of the project team should participate in the preparation and review of these plans. In addition, a schedule of the review and approval process for these plans needs to be established, accepted by all reviewers, and distributed before release of the first draft; reviewers should meet an established schedule for review and submission of comments. A distinction between "review" and "approval" authority needs to be made. (Chapter 6 provides guidance on review and approval of HASPs.)

Once adopted, plans are to be periodically reviewed and evaluated for effectiveness and cost/benefit. If the scope of work or the worksite hazards change significantly or if lessons learned indicate, the plans are to be promptly modified and revised. (See Chapter 6 for guidance on the HASP modification process.)

COMPREHENSIVE WORK PLAN

A comprehensive work plan is required by 29 CFR 1910.120 (b)(3). It is based on information gathered during the design phase of a project and provides details on the scope of work and associated tasks, the resources required to complete the project, and the schedule. The comprehensive work plan contains the following elements:

- Identification of anticipated cleanup activities and standard operating procedures; if standard operating procedures are provided elsewhere, they are referenced and not repeated;
- Defined work tasks and objectives, and identification of methods for accomplishing tasks and objectives;
- Personnel requirements for implementing the work plan;
- Training requirements and implementation of required informational programs per 29 CFR 1910.120 (i);
- Provisions for implementation of the medical services program; and
- Specialized equipment or services (e.g., drilling equipment, heavy equipment operators) or both.

DEACTIVATION AND DECOMMISSIONING PLAN

Deactivation and decommissioning plans are similar to comprehensive work plans and are prepared for deactivation and decommissioning projects. Policy and guidance on the conduct of decommissioning activities that fall under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended (CERCLA) and HAZWOPER, is provided by the DOE/EPA Interagency Agreement, "Policy on Decommissioning Department of Energy Facilities Under CERCLA" and the accompanying "DOE Environmental Restoration Program Decommissioning Implementation Guide" issued in May 1995. The Office of Nuclear Material and Facility Stabilization (EM-60) has published the DOE policy and guidance on deactivation in their "Material Stabilization and Facility Deactivation Project Policies and Supplementary Information" document. In addition, DOE 5820.2A, "Radioactive Waste Management," defines the content of a decontamination and dismantlement (D&D) plan (see Table 3-3). Key phases that begin before the start of decommissioning include transition, project preparation, environmental review, deactivation planning, and engineering.

HEALTH AND SAFETY PROGRAM AND THE HASP

Hazardous waste activities at DOE worksites are to comply with the health and safety program. The HASP for hazardous waste activities generally focuses and specifies the appropriate elements of the site's existing health and safety program to the task at hand. The existing programs are thoroughly reviewed to identify those elements meeting the needs of the planned hazardous waste activity. Program elements and procedures are supplemented with worksite-specific detail and tailored to meet special or unique aspects of the hazardous waste activity on an as-needed basis.

RADIOLOGICAL CONTROL PLAN

Radiological protection program requirements have been established in 10 CFR 835 and its associated implementation guidance, and in DOE N 441.1, "Radiological Protection for DOE Activities." Contractual obligations to comply with additional requirements as stipulated in DOE Orders that have been canceled remain in effect until the contract is modified to delete reference to the requirements in the canceled Orders (this includes the DOE RadCon Manual, which has been reissued as the *Draft DOE Radiological Control Technical Standard,* DOE-STD-1098-96.)

Chapter 3 of the *Draft DOE Radiological Control Technical Standard* provides guidance for the design and planning processes for the conduct of operations in radiologically controlled work areas. The primary goals of planning hazardous waste work activities in radiologically controlled areas are to provide for worker health and safety and to maintain radiation exposures as low as reasonably achievable (ALARA).

Development of a site-specific radiological control program is based on the requirements of 10 CFR 835, DOE N 441.1, and recommendations found in the *Draft DOE Radiological Control Technical Standard*, including those for engineering controls and dose-reduction and contamination-reduction methods that may be used during maintenance and modification operations. Radiological work permits (RWPs) provide the planning and work control mechanism for routine tasks. Each RWP contains a summary of radiological conditions and work-area entry requirements, including those for PPE and worker training, as well as anticipated worker exposure during specific work activities.

The radiological protection program/radiological work permit (RPP/RWP) process is similar in purpose to that of a health and safety program and HASP, and provides the basis for controlling both the worksite and its activities, including the conduct of pre-job briefings. The two parallel sets of planning and work control documents are coordinated—either in a single document incorporating radiological issues and requirements with those of the health and safety program and the HASP, or in two parallel documents implemented through a coordinated effort between line management, health and safety, and radiological protection workers (see Chapter 6).

EMERGENCY PLAN

Additional planning requirements are detailed in 29 CFR 1910.120 (q), which covers hazardous substances released or substantial threat of release at any location; paragraph (p), which addresses treatment, storage,

and disposal (TSD) activities or facilities; and paragraph (l), which addresses remedial actions. Whether intended for uncontrolled hazardous waste sites or TSD activities or facilities, health and safety planning must provide for emergency action and response relative to a particular facility or worksite. At a TSD facility, the emergency action and response plan developed for the worksite must be a part of the HASP or the health and safety program. (Chapter 6 summarizes emergency action and response plan content for HASPs; Chapter 10 provides guidance on emergency preparedness and response.)

Table 3-3. Elements of a Deactivation and Decommissioning Plan

I. Introduction
- Facility characteristics
- Estimated costs
- Controls and audits
- Scope and objectives
- Schedule
- Key responsibilities

II. Facility History, Characterization, and Status
- Historical operations
- Inaccessible systems
- Maps, drawings, photographs
- Safety analysis and review
- Past spills/releases/accidents
- Hazard/contamination (locations)
- Hazards/contamination (types and amounts)
- Risk assessment (DOE 5480.23, "Nuclear Safety Analysis Reports")

III. Alternative Selection
- Preferred alternative
- Other alternatives considered

IV. Decommissioning Activities
- Objectives
- ES&H controls
- Major activities
- Associated accidents/exposures

V. Program Management
- Organization and responsibilities (e.g., quality assurance, procedures, training, change control, physical security)
- Cost (e.g., estimates and details, available funding/mechanisms)
- Schedule (e.g., milestones, interrelated timelines)

VI. Worker and Environmental Protection
- Health physics program
- Health and safety program
- ALARA practices
- Environmental protection

VII. Waste Management
- Projections of volumes, contaminant levels, and classifications
- Procedures, processes, and systems for handling, storage, and disposal
- Effect on work procedures
- Storage locations, controls, and timetables

VIII. Final Survey Plan
- Final survey methods
- Ongoing requirements
- Release criteria
- Remaining contamination levels

Coordination with the existing response community is important in developing the emergency response plan. A national response organization was established by a congressionally mandated National Contingency Plan to implement procedures for coordinating response to releases of hazardous substances into the environment. This National Contingency Plan establishes response teams composed of representatives of Federal agencies and State and local governments. The EPA-designated official responsible for coordinating Federal activities related to site cleanup is an important contact for hazardous waste site personnel.

WORK CONTROL

The work control system is an essential planning tool for implementing health and safety and operational controls for DOE hazardous waste activities. Information in the site health and safety program is more broadly based than the HASP, which is a work control document that defines worksite- and task-specific health and safety controls. The HASP includes the process for applying job- or task-specific work controls that are narrowly focused on specific daily activities. (Further information on the work control system and associated documentation is provided in Section 6.5.)

3.8 IDENTIFYING REQUIRED RESOURCES

The planning process also involves careful analysis of the need for and timing of resources to carry out hazardous waste activities. Resources include the following:

- Qualified personnel to fill staffing requirements and assignments;
- Equipment, facilities, supplies, tools, and utility services (e.g., PPE, sampling equipment, instrumentation, water, electricity, sewage treatment); and
- Outside support services (e.g., medical surveillance; laboratory analyses; training; emergency response to accidents, injuries, fires, and hazardous materials incidents; technical experts).

Adequate resources are fundamental to good health and safety practice and to performing the job properly to completion. Many mishaps have been traced to improperly trained workers, lack of adequate tools, or requirements for personnel to work excessive hours or at unfamiliar jobs because of inadequate staffing. The multidisciplinary team approach to identifying required resources efficiently balances, identifies, and coordinates necessary assets.

3.9 LESSONS LEARNED

The size and diversity of the DOE complex give rise to a wide range of health and safety hazards. Most environmental restoration activities that would reduce the numbers of these hazards are in the initial stages of development and implementation. Accordingly, individual sites need to document and disseminate information that could enhance their hazard recognition and mitigation. Such information is used to prevent recurrences of identified problems, to publicize good practices and innovative approaches to problem-solving, and to perform work more safely and efficiently.

Within DOE, the term "lesson learned" has been defined in DOE-SAD-TMP-23-94, "Lessons Learned Technical Standard," as a "good work practice or innovative approach that is captured and shared to promote application. It may also be an adverse work practice or experience that is captured and shared to avoid recurrence." The term is used by DOE, as well as by other Federal and private-sector institutions, to describe the following:

- Work processes or health and safety issues that could affect multiple programs or projects;
- Significant experiences (both positive and negative) that could result in changes to management practices or the conduct of operations; and
- Lessons, problems, discussions, or potential solutions that appear in searchable data bases.

Lessons Learned

Lessons learned information provides a valuable tool for managing health and safety programs at hazardous waste sites. Such information addresses conditions to be avoided or commendable practices with the potential for wide-ranging application. Effective identification of lessons learned requires an awareness of emerging practices, programs, and technologies related to hazardous waste activities.

The Lessons Learned Standard provides protocol requirements for the electronic dissemination of lessons learned. The DOE Lessons Learned Information Services uses the Internet to exchange information. Published lessons learned may be accessed from ES&H Technical Information Services (TIS). The Universal Resource Locator (URL) is: gopher://dewey.tis.inel,gov: 2010/11%2F%2E11 by using either Gopher Clients or World Wide Web Browsers. Local users provide TIS with their URLs, and they are added here for convenience.

DOE Lessons Learned Alerts are being distributed using an automated electronic mail list server to provide an expeditious means to share information. Contact Los Alamos National Laboratory at 505-667-0598 for subscription information. Both types of information can be used to improve performance in such areas as production.

3.10 REFERENCES

29 CFR 1910.120, "Hazardous Waste Operations and Emergency Response"

29 CFR 1910.1030, "Bloodborne Pathogens"

40 CFR 300, "National Oil and Hazardous Substances Pollution Contingency Plan"

DOE 5820.2A, "Radioactive Waste Management"

DOE 5480.23, "Nuclear Safety Analysis Reports"

DOE-STD-1098-96, *Draft DOE Radiological Control Technical Standard*

DOE/EM-0054-SAD, "Health and Safety Plan (HASP) Guidelines," February 1994

DOE/EM-0182, *Handbook on Roles and Responsibilities for Environmental Management*

DOE/EM-STD-5503-94, "DOE Limited Standard EM Health and Safety Plan Guidelines"

DOE-SAD-TMP-23-94, "Lessons Learned Technical Standard"

DOE (EM-60), "Material Stabilization and Facility Deactivation Project Policies and Supplemental Information"

U.S. Department of Energy/U.S. Environmental Protection Agency Interagency Agreement, "Policy on Decommissioning Department of Energy Facilities Under CERCLA," May 22, 1995

U.S. Department of Energy Environmental Restoration Program "Decommissioning Implementation Guide," May 22, 1995

DOE/EM-0246, "Decommissioning Resource Manual"